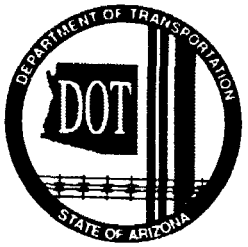

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USE OF SOLAR ENERGY FOR LIGHTING OF OVERHEAD GUIDE SIGNS, ROADWAY LIGHTING, AND INTERSECTION TRAFFIC SIGNALS

Final Report

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Federal Highway Administration

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16. ABSTRACT

The principal objective of this study was to demonstrate the technological and economic feasibility (or lack thereof) of photovoltaic powered systems for overhead guide sign lighting, roadway lighting, and traffic signalization.

A preliminary technical and economic feasibility study concluded that the first two applications were feasible, but that full-scale traffic signalization was not. In lieu of full-scale traffic signalization, the project developed a system to power flashing warning lights.

Photovoltaic systems were designed, constructed, field tested and evaluated for overhead guide sign lighting, roadway lighting, and powering of flashing warning lights.

All these systems were found to be dependable and economical for application at remote sites where a conventional power supply is not available. In addition, previous research has shown that roadway lighting can have a safety benefit at remote locations which have a high nighttime accident rate and that flashing warning lights have a safety benefit.

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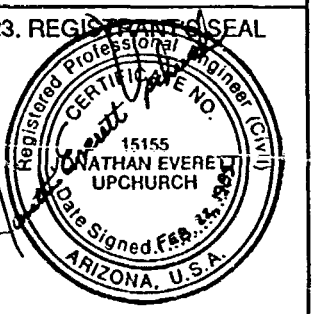

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- Mr. Bob Etheredge and Mr. Ed Pressley, Electrical Operations Branch, Traffic Engineering Section, Arizona Department of Transportation
- Mr. John Arens, Federal Highway Administration

SI (METRIC) UNIT CONVERSION FACTORS

The material contained in this report is presented primarily in terms of English units. The following factors may be used to convert the measures used in this report between the English units and the International System of Units (SI):

1 mile = 1.6093 kilometers

1 kilometer = 0.6214 miles

1 foot = 0.3048 meter

1 meter = 3.2808 feet

1 square foot = 0.0929 meters squared

1 meter squared = 10.764 square feet

1 inch = 2.54 centimeters

1 centimeter = 0.3937 inches

Celsius temperature = (Fahrenheit temperature - 32) x 5/9

Fahrenheit temperature = (Celsius temperature x 9/5) + 32

1 kilojoule = 0.000278 kilowatt-hours

1 kilojoule = 1000 watt-seconds

1 kilojoule = 0.949 British Thermal Units

1 British Thermal Unit = 1.054 kilojoule

1 gallon = 4.405 liters

1 liter = 0.227 gallons

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii
SI (METRIC) CONVERSION FACTORS iii
LIST OF FIGURES vi
CHAPTER 1 INTRODUCTION 1
OVERHEAD GUIDE SIGN LIGHTING 2
ROADWAY LIGHTING 3
TRAFFIC SIGNALIZATION 3
CHAPTER 2 PROJECT DESCRIPTION 5
TASK 1. REVIEW EXISTING APPLICATIONS 5
TASK 2. PRELIMINARY TECHNICAL AND ECONOMIC FEASIBILITY STUDY . . . 5
TASK 3. PREPARE INTERIM REPORT 6
TASK 4. PROJECT COMMITTEE REVIEW OF INTERIM REPORT 6
TASK 5. DESIGN OF PHOTOVOLTAIC SYSTEMS 6
TASK 6. CONSTRUCT AND INSTALL SYSTEMS 6
TASK 7. TEST SYSTEMS 7
TASK 8. PERFORM ECONOMIC ANALYSIS 7
TASK 9. PREPARE FINAL REPORT AND RECOMMENDATIONS 7
CHAPTER 3 TECHNICAL AND ECONOMIC FEASIBILITY STUDY 8
OVERHEAD GUIDE SIGN LIGHTING APPLICATION 8
ROADWAY LIGHTING APPLICATION 9
TRAFFIC SIGNALIZATION APPLICATION 12
FLASHING WARNING LIGHT APPLICATION 13
CHAPTER 4 DESIGN OF PHOTOVOLTAIC SYSTEMS 15
COMMON DESIGN SPECIFICATIONS 15
OVERHEAD GUIDE SIGN LIGHTING 22
ROADWAY LIGHTING 23
FLASHING WARNING LIGHT 24
A DOUBLE FLASHING WARNING LIGHT 25
CHAPTER 5 CONSTRUCTION AND INSTALLATION OF SYSTEMS 26
CHAPTER 6 FIELD TESTING 33
CHAPTER 7 ECONOMIC ANALYSIS 35
REPLACEMENT OF EXISTING CONVENTIONALLY-POWERED SYSTEMS 35
NEW SYSTEMS 35

Page

CHAPTER 8 RECOMMENDED SPECIFICATIONS FOR PHOTOVOLTAIC SYSTEMS 37
SYSTEM OUTPUT SPECIFICATIONS 38
SYSTEM INPUT SPECIFICATIONS 38
OTHER CONSTRAINTS 39
CHAPTER 9 CONCLUSIONS 41
CHAPTER 10 RECOMMENDATIONS 42
CHAPTER 11 RECOMMENDATIONS FOR FURTHER STUDY 44
APPENDIX A PHOTOVOLTAIC APPLICATIONS IN HIGHWAY ENGINEERING 45
APPENDIX B SOLAR INSOLATION IN THE PHOENIX, ARIZONA AREA . . . 50
LIST OF REFERENCES 65

LIST OF FIGURES

Figure	Description	Page
1	Typical 40 Watt Photovoltaic Module	16
2	Schematic of Photovoltaic System	17
2a	Electric Circuit Details, DC System	18
2b	Electric Circuit Details, AC System	19
3	Installation of the Roadway Lighting System	27
4	Installation of the Array for the Flashing Warning Light System and the Sign Lighting System	28
5	Detail of Structure Used for the Flashing Warning Light System and the Sign Lighting System	29
6	Completed Roadway Lighting System	30
7	Arrays for the Sign Lighting System and the Flashing Warning Light System	31
8	Flashing Warning Lights Powered by the Photovoltaic System	32